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MUSK-DEER.

[Musk-Deer (*Moschus moschiferus*).]

If our readers will refer to No. 300 of 'The Penny Magazine,' for the year 1836, they will find some observations on the group or family termed *Moschidæ*, of which the Musk-deer may be regarded as the type, and which, besides the present animal, includes the Meminna, a native of Ceylon, and the Napu (of which a figure and description are given) and the Kanchil, both natives of Java and Sumatra. Unlike its relatives, which inhabit the forests of Ceylon and Java, &c., the Musk-deer tenants the great mountain-range which belts the north of India, and branches out into Siberia, Thibet, and China, through a vast extent of which it ranges, preferring the bold precipitous crags and wild rocks on the borders of the line of snow, to the valleys or the lower elevations. It is common in Nipâl, Boutan, Thibet, and the adjacent districts of China. It also abounds in the Altaic range near Lake Baikal, where it was observed by Pallas, and on the mountains of Kouznetzk near the Lake Telet-Koï. The fur of the Musk-deer, indeed, sufficiently declares, in its texture and thickness, that this animal is essentially a native of a cold region, being not only full and long, but of that peculiar harsh or rigid and inelastic texture which we observe in the chamois, or rather in the klip-springer of the mountains of southern Africa, and also close-set so as to form a substantial covering. Common as is the Musk-deer in the great Alpine ranges of Asia, it nevertheless does not appear to have been known to the ancients, a circumstance doubtless to be attributed to the almost inaccessible nature of the regions it frequents; for mountain-ranges not only offer but few inducements to tempt the ambition of the great conquerors of nations, and are not easily overrun by armies, which lay waste the low lands without difficulty, but they oppose many obstacles to the researches of the curious, and their human inhabitants are often even scarcely known to the people of the plains below, and even preserve themselves distinct and apart, rather repelling than courting the intercourse of tribes or nations more advanced in civilization. Mountain-ranges in fact are in a certain sense isolated, as if surrounded by sea, instead of plains, and it is with the productions of the greater chains which traverse Asia that naturalists have yet the most imperfect and limited acquaintance. While, for example, the mammiferous animals and the birds of the Indian peninsula are well

known, we are presented perpetually with new forms and new species from the Himalaya mountains: witness new species of birds figured in the splendid work by Mr. Gould on the ornithology of that range, and the results of the labours of Mr. Hodgson, to whom we owe our knowledge of the Chiru Antelope, the Thar, the Nayour, the Jhâral, &c. We can scarcely wonder then that the Musk-deer was not known to the ancients; indeed it is only very recently that a correct knowledge of the animal and its habits has been gained; some having regarded it as a kind of goat (*Capra Moschi*, Aldrovandus, 'Bisulc.,' p. 743), and others as allied to the Roebuck (*Capriolus Moschi*, Jonston's 'Quadr.'). Like the rest of the family to which it belongs (*Moschidæ*, genus *Moschus*, Linn.) the Musk-deer is altogether destitute of antlers, but the males have large canine teeth in the upper jaw, which bend downwards and project considerably from the mouth; they are sharp-pointed, and compressed, with a cutting edge posteriorly, but, from their position, can hardly be regarded as weapons; though they are often upwards of three inches in length. It is from the male of this species that the celebrated drug and perfume commonly known under the name of *musk* is procured. This substance is an unctuous secretion, analogous to that of the Civet or of the Beaver, elaborated in a glandular pouch or sac situated in the skin of the abdomen (*sacculus preputialis*), and when dry it becomes dark-brown or nearly black and somewhat granular. Its peculiar odour is well known. Formerly it was in high repute for its medicinal virtues, and still holds a place in the *materia medica* of practitioners, but the estimate of its properties as a stimulant and antispasmodic, &c. has much declined. The introduction of musk into the *materia medica* appears to be due to the Arabians, by whose writers the animal producing it is first distinctly mentioned, having been described, as Daubenton states, by Serapion in the eighth century; but we know not the time when this article found its way into Europe; from the silence of Aristotle and Pliny respecting it, we may conclude they were as unacquainted with it as with the animal producing it. Nevertheless in Boutan, Tonquin, China, Chinese Tartary, and other districts, it appears from time immemorial to have been used both in medicine and as a perfume, and to have formed an article of trade among the inhabitants of those countries, who likewise esteemed the animal producing it for the sake of its flesh.

Abusseid Serafi describes the musk animal as being very similar to the roe, but he erroneously states it to have horns of a straight form or slightly bent back; he mentions, however, at the same time, its long projecting canines. As Buffon well observes, it is probable that the circumstance of horns being attributed to it by this writer, who had perhaps never seen a living animal, was suggested by analogy; for he might naturally enough be led to infer that since it otherwise resembled the roe, it would not be destitute of these appendages. Aldrovandus has copied this error. Among other Arabian writers who have noticed the Musk-deer is Avicenna, who refers to its follicle, or musk-sac, and its large bent canines.

Kircher ('La Chine Illustrée, de Kircher,' Transl. Franç., 1610) observes that a certain kind of deer is found in the provinces of Xensi and Chiamsi, which has an agreeable odour, and to which the Chinese have given the name of Xerchiam, that is to say, the "animal of the musk." 'The Chinese Atlas' speaks of it in these terms: "Not to keep you in suspense respecting the signification of this name or this word, *Muschus*, I will tell you that I have seen it (the animal) more than once. It has a certain protuberance at the navel, which resembles a small sac, because it is surrounded with a very delicate skin, covered with hair very soft and very fine. The Chinese call this animal Xe, which means *odour*, whence they compose the word Xechiang, which signifies the odour of the animal Xe or Se, *Muschus*. It is four feet long, and is as active as a deer; all the difference is that it is a little blacker coloured, and that it has not horns like a deer. The Chinese eat its flesh because it is very delicate. The provinces of Suchuen and of Junnan greatly abound with this species of animal, and it may be observed that of all the countries of China none have it in such numbers as those which approach nearest the west."

In some districts the Musk-deer is extremely abundant, and is slaughtered in vast multitudes for the sake of the musk, which forms, and has long formed, an article of extensive traffic. But according to all accounts this substance is liable to great adulteration. To this practice the celebrated merchant-traveller Tavernier alludes, and he adds that the odour of the substance, when recent, is so powerful as to cause the blood to gush from the nose. According to the same writer the musk-animal is very common in the 60th degree among the wooded mountains, whence, as he adds, in February and March, when the snows have covered the earth (which they do to the depth of ten or twelve feet), hunger drives them southwards into the lower lands, to the 44th or 45th degree, in search of green corn and other herbage. At this season the peasants wait for them on their passage, and catch them in snares, or kill them with arrows and clubs; and Tavernier further says that some have assured him that they are often so weak and meagre as to be taken by running them down. With reference to their number, he states that during one visit to Patana he bought sixteen hundred and seventy-three musk-bags, which weighed two thousand five hundred and fifty-seven ounces and a half, or of pure musk four hundred and fifty-two ounces. Of the extraordinary power of the odour of musk when fresh, we have statements agreeing with that of Tavernier from Chardin. We cannot, however, help thinking that there is some exaggeration, perhaps not a little, in these accounts, which if generally believed might have the effect of deterring many merchants from engaging personally in a lucrative commerce, and so restrict the trade at its fountain to those only who were habitually engaged in it, and who might wish for a monopoly. This indeed is merely a suggestion. Certain it is that when procured in Europe in the ordinary way of commerce it produces no such violent effects as are attributed by Tavernier and Chardin to it. It may indeed lose, and doubtless has lost, much of its strength, and is moreover never or very rarely to be got pure, being generally adulterated with blood and other ingredients.

Chardin says, "It is commonly believed that when the musk-sac is cut from off the animal, it exhales so powerful an odour, the hunter is obliged to have the mouth and nose stopped with folds of linen; and that often, in spite of this precaution, the pungency of the odour is such as to produce hæmorrhage to such an extent as to end in death. . . . I have," he adds, "gained accurate information respecting this circumstance, and as I have heard talk of the same thing among some Armenians who had been to Boutan, I think that it is true. My reason is, that this drug does not acquire strength by time, but, on the contrary, gradually loses its strength; nevertheless the odour is so powerful in the Indies that I never could support it. When I trafficked for musk I always kept in the open air with a handkerchief over my face, and at a distance from those who handled the sacs, referring them to my broker; and hence I knew by experience that this musk is very apt to give headaches, and is altogether insupportable when quite recent. I add that no drug is so easily adulterated, or more apt to be so," &c. &c.

The diffusiveness and subtlety of the scent of musk are very remarkable; everything in its neighbourhood becomes soon infected with it, and retains it long; hence a very minute portion, a grain or two, is sufficient for the ordinary purpose of imparting to articles of dress or

other matters a (to some) agreeable perfume. That from Boutan, Tonquin, and Thibet is most highly valued; but it is very probable that, both in strength and in the quantity produced by a single animal, it varies according to the season of the year and the animal's age: a single musk-bag ordinarily contains from two to three drachms. When cut off, it is tied up ready for sale.

In size the Musk-deer is about equal to our European roebuck, standing two feet in height at the shoulders; the forehead is arched, the eyes large, the ears rather ample, and very moveable; the tail is a mere rudiment, concealed by the long, harsh, and almost spine-like hair with which the animal is universally covered. There are no lachrymal sinuses. The general contour is compact, and displays great vigour, the limbs being robust, and well adapted for climbing and leaping among the rocks of the mountain ranges. The hoofs are strong, broad, and expanded; and the posterior rudimentary hoofs are so developed as to touch with their points the surface on which the animal treads, so as to add to the security of its footing.

The general colour of the Musk-deer is brown, washed with grey and pale yellow, each hair being tipped with ferruginous; obscure grey or whitish marks often occur on the sides, especially in immature individuals; the shoulders and limbs are of a deeper tint than the body. The female is less than the male, and is destitute of tusks or long canine teeth, and of a musk-sac. The teats are two in number. In its manners the Musk-deer resembles the chamois; its favourite haunts are the pine-forests on the mountains, and its agility is very great, enabling it to spring from rock to rock with great care and address. It is extremely wild and shy, and is said to be cautious and watchful against surprise, taking refuge, when pursued, among the crags and precipices of the more elevated peaks of the ranges it tenants; yet, in despite of all its vigour and shyness, it falls a sacrifice to the energy and the contrivances of man. The male is said to seek the female in November and December. We are not aware that a living specimen of this animal, common as it must be in certain districts, has ever been imported into England. In 1772 a male of this species was living in the park of Mons. de la Vrillière, at Versailles, in France; and Daubenton, who published a description of it, informs us that the odour it exhaled, and which was carried with the wind, was quite sufficient to guide to the spot where the animal was kept enclosed. "When I first saw it," he adds, "I recognised much resemblance in its figure and attitude to those of the roe, the gazelle, and the chevrotain. No animal of this (the deer) tribe has more activity, suppleness, and vivacity in its movements." It was extremely timid and wild; but, like all the species of the peculiar group to which it belongs, it is gentle and inoffensive. The chevrotains, as we well know, may be rendered very tame; and it is probable that if the Musk-deer were taken while young, it might be easily domesticated, since the former animals are shy and timid in the extreme while in a state of natural freedom, but soon gain confidence, and have even bred in captivity in our uncongenial climate.

A good figure of the Musk-deer is given by Buffon in the 6th vol. of his Supplement. Fine specimens of this species, and its allies, the Meminna, the Kanchil, Napu, &c., are to be seen in the museum of the Zoological Society, London.

MANNERS AND CUSTOMS IN WESTMORELAND AND CUMBERLAND.

[From a Correspondent.]

There is no section of country in England where old customs, manners, and opinions have been more steadily retained, than in the mountain districts of Westmoreland and Cumberland. Perhaps even a wider range might be taken, and the adjoining mountainous districts of Lancashire and Yorkshire on the one hand, and of Durham on the other, might be included; yet I think the application could not be brought home so decidedly to them, since many of their valleys and hamlets are more or less connected with some kind of trade, export, or manufacture—or with other communities that are directly engaged in those pursuits. To illustrate this it may be stated, that the population of the wild district separating Cumberland and Westmoreland from Durham are principally employed in the lead and coal works; while in the district on the confines of Lancashire and the adjacent parts of Yorkshire the people are themselves engaged in manufactures, or else within the immediate influence of populous manufacturing communities. Now neither of these cases applies to the sequestered valleys, secluded hamlets, and lonely farm-cottages among the mountains separating Westmoreland from Cumberland, besides including the extensive moorland regions of the latter county, extending probably over more than two-thirds of the whole.

As regards the inhabitants of the remote dales and moorland wastes, whose occupation is purely agrarian, if they positively had the inclination, they possess not the means of turning their small tenements and possessions to more account than that to which they were turned centuries ago. Probably something over one-half of the population in those parts reside upon small farms of their own, worth at the present time from ten to seventy pounds a year,—a very small proportion rising above that sum,—but the majority of them worth no more than twenty or thirty pounds per annum. Now even with those who live upon these small farms of their own, much prudence and economy have to be exercised in order to enable them to live upon such exceedingly limited incomes; while with such as *rent* the small farms upon which they reside, a still more rigid economy, self-denial, and greater bodily exertion become necessary to gain a poor livelihood. It is true that their manner of living is not precisely what it was a century ago, neither with respect to diet nor clothing. One luxury, tea, may even there be said to be almost universal; and although it is used sparingly, and often by none but the heads of households, still it is now considered one of the necessaries of life; and on all occasions of friendly visits, it invariably is the standing dish in the lowly cottage, as well as in the sanded parlour of the independent yeoman. Sugar, of course, is an accompaniment to tea and coffee; but I know of no other article of luxury considered as absolutely necessary in the household of a small farmer in those mountain districts. It must be remarked, however, that now few families (except of the very lowest grade) live exclusively upon oat and barley bread—or rather cakes; and though many of them do not frequently eat of the wheaten loaf, almost every one, on some rare occasion, enjoys his "bannock of wheat flour,"—or a baker's roll brought from some distant market-town. Porridge, milk, potatoes, and oaten cake, with a small quantity of bacon once a day, constitute the ordinary food of the inhabitants of these mountain districts. At the period when there was no duty upon malt, many of the farmers brewed a little beer; but at the present day, even amongst those who live upon farms of their own, worth eighty or a hundred pounds a year, very few ever think of brewing, except during the season of hay-making, — that being almost the only harvest in those rural districts. Sometimes a sheep is slaughtered when an extra supply of provisions is required; when those joints not used in the family are taken round amongst the neighbours, and disposed of in the best way practicable. Sometimes small joints of meat are sent for to the distant market by the weekly carrier (where there happens to be one) or by the butter-badger.

With respect to the matter and manner of clothing, the change has been considerably greater; for since plain

and printed cottons became cheap, the coarse worsted-stuffs and the home-spun linsey-woolseys are in a manner discarded; except among the aged dames and matrons, who yet entertain strong prejudices against all new-fangled ways. At the commencement of the present century there was scarcely a family that did not spin its annual supply of linen-yarn, and some well-accustomed local weaver or webster converted it into a web, which, on being returned to the owner, was then bleached and battled until it became snow-white, and ready to be converted into such articles of domestic use as the family stood in need of. At the present day not one family in fifty supply themselves in this way, finding it cheaper to purchase linen, tow, or cotton-cloth, from the shopkeeper in some market-town, or from some wandering pedler, than manufacturing it in their own establishments. Indeed woollen-cloth, too, is now but rarely manufactured at home, although you do occasionally fall in with some ancient gray-coat (yeoman) that disdains to wear any garment that is not carded and spun at home, of the wool of his own flock, not even going to the expense of dyeing the material, but mixing certain proportions of black and white wool together in the natural state in which it was shorn from the sheep's backs. Stockings are still carded, spun, and knit in every family,—although of late years you will see young damsels, when attired in their Sunday's apparel, who have ventured to discard (for the day) the black worsted, and to adopt the white cotton hose. Other innovations have been made, and are still making; but the prejudices that exist against everything new-fangled are so strong, that some generations will pass away before these people have reached the point to which some of our population, not a hundred miles distant, have already attained.

Since these mountain and moorland districts raise but a small quantity of corn (chiefly oats and barley), the price of that commodity has a powerful influence upon the domestic comforts of the inhabitants. Wool, of a coarse quality, may be considered their staple article of produce, but where the wastes and commons have been enclosed (many of which have within the last fifty years) the smaller farmers cannot now keep the flocks they once did. They therefore have to depend upon the produce of a score or two of sheep, a little butter, and the annual increase of two or three young cattle. The sheep-farmers, in addition to their produce of wool, sell off yearly a portion of their flocks; but their enclosed ground being very inadequate to the maintenance of their large flocks during the long winters, a considerable part of the produce of their sales is expended in hiring winter eatage for them in distant, warmer, and more fertile parts of the country.

A *butter-badger* is still an essential personage in every little isolated community. He is a person who collects butter from house to house weekly; or in some cases, where this would cause him a vast deal of trouble, two or three farm-houses are appointed for the housewives to meet him at, with their baskets covered with snow-white napkins, at a certain hour, when they count out to him their pounds of butter, and give orders for such small articles as they may want, and which can only be had at the distant market-town. Less than a century ago these persons used pack-horses, and the butter was deposited in large panniers placed upon pack-saddles; but at the present day there are few houses, even in the steep and narrow valleys, that cannot be approached by the small one-horse carts of the country, though, in numerous situations, not without danger and difficulty.

To obviate the necessity of these people having to seek distant markets, cattle and sheep dealers make periodical trips to the most secluded situations, as do also wool-staplers; and the itinerant tea-dealer may be seen perambulating hill and dale in the way of his business.

The ancient manners of the inhabitants of these districts have undergone but little change. Few of the people are better educated than were their great-grandfathers; and, what is very remarkable, there apparently exists amongst the people generally a perverse objection to the saying or the doing of anything "like a gentleman." I well recollect a youth who was hired into my father's family, whom the rest of the farm-servants were continually scoffing and jeering for the manner in which he spoke, his dialect and phraseology being far less corrupt and vulgar than their own. So it is even at the present day, and any rustic that should happen to pronounce the word *snow* otherwise than "sna" or "snaw," would, as they familiarly express it, "niver hear't last on't."

While the inhabitants of those wild and bleak regions have continued to reject new "whims and whamseys," those of the better order, that have been thrown amongst them professionally or otherwise, have pretty much ceased to mingle in the pastimes and amusements as was formerly their wont. Fifty years ago, the *parson* (as the clergyman is called, whether speaking to him or of him) was expected to be present at all occasions of feasting and merry-making, if he resided within the distance of a few miles. The wedding ceremony necessarily had to be performed at the "kirk" or "chapell;" but the parson's presence was as regularly expected at the wedding dinner, where it was his custom to preside, as well as to dance with and kiss the bride, in the evening. When the christening followed in due course, the child was never taken to the church, but the friends and neighbours were invited to the dwelling of the parents on a certain day; where, on the arrival of the parson, the ceremony was performed during some short cessation of the general hilarity.

Again, when death made an unwelcome inroad into some little domestic circle, the custom *was* (and still *is*, in many places) to invite all the family connections, as well as all the neighbours through a wide circuit, to assemble and *dine* at a stated hour at the house of the deceased, before conveying the corpse to the distant burial-ground upon a rude and ancient bier; and on these occasions "the parson" was looked for as a principal guest. Then, again, in their sheep-shearings and Christmas festivities, his presence could not be dispensed with, and the more he appeared to enjoy the jovial scene, the higher he was held in the estimation of the assembled parishioners. It should be observed, however, that the resident clergy of these districts were not college bred then, but for the most part the sons of yeomen and farmers; who, after continuing at some of the small endowed schools in that neighbourhood (of which there are several) until they were competent to translate a small portion of Grotius, and stammer through a chapter in the gospels of the Greek Testament, were then considered sufficiently learned for entering into holy orders. During the few years that necessarily intervened between their leaving school and entering the Church, on account of their age, many of them became teachers of these small schools, while others, for want of scholastic employment, would assist in farming affairs until an opportunity offered of getting ordained to some curacy in the district; for in those days, and in fact till within the last twenty years, some of our northern diocesans did not object to ordain young men whose names had never been entered upon the boards of one of our universities. At the present day the case is altered; but of the present generation of the clergy of this wide district a large proportion of them are of the old school. However, the merry christenings are no longer farm-house ceremonies, the bishops having, very properly, insisted upon the children being taken to the churches and chapels; and that peculiar kind of familiar intercourse subsisting between the parsons and their flocks, has for some years been rapidly declining.

MALTA AND THE MALTESE.—No. I.

[Valletta, looking into the Harbour from Fort Ricasoli.]

In no place of equally circumscribed extent is the confluence of strangers greater than at Malta. It is the most important quarantine station in the Mediterranean; and since the development of steam-navigation, it is resorted to by travellers from all countries. It is constantly frequented by trading vessels from France and Italy to the Levant; to our ships of war on the Mediterranean station it is a most convenient rendezvous; and the steam-vessels to Gibraltar, to Corfu and Patras, and to Beyrout and Alexandria, find it indispensable to touch at the island for a supply of coal. If the path to India through the Mediterranean should continue to increase in importance, Malta will be one of the principal links in this line of intercommunication. The political importance of Malta to the United Kingdom is inferior only to that of Gibraltar; and whenever naval warfare is carried on by steam-ships, its value will be greatly increased, if that be possible, as success may depend upon a supply of fuel, and that will be contingent on the vicinity to a depôt of coal. It will become as essential to have in store a supply of coal as of gunpowder or any other munition of war. A notice of Malta and Valletta has already been given in the 'Penny Magazine' (No. 131), and its history to the close of the last century is identified with that of the Knights of Malta, an account of which Order, from its origin to its final extinction, has been detailed at considerable length in Nos. 266, 269, 271, 273, and 274. But the circumstances which attended that change, and eventually led to our taking possession of Malta, form an interesting point in the history of the island.

The Knights of Malta were classed into seven nations called "languages," namely, Provence, Auvergne, France, Italy, Aragon, Germany, and England. During the middle ages they and the Templars animated and led on the supporters of the Cross, and by their exertions successfully defended the Christians of the East of Europe from the domination of the Mussulmans. This was a period in which the Knights occupied a useful and natural station, and the institution was in unison with existing interests. But it ceased to be so when the objects of the Order were fulfilled; and when the French Revolution shook the stability of even the firmest institutions, that of the Knights of Malta, which had long been declining, could not be expected to survive the shock. In 1798, a French expedition with 40,000 men arrived off the island, and the knights of the French "language" or "langue" were already prepared to abandon the general interests of the Order. The grand-master was destitute of every quality which such an emergency demanded, and nothing effectual was done to concert measures of defence. A series of blunders was all which he accomplished. The people were more chivalrous, and flew to arms, but they were deluded by false assurances of security. The day after their arrival, the French landed, and quietly took up the best positions for an attack, unmolested except by some Maltese battalions. The grand-master, learning that some of the French knights had been killed and wounded by the people, solicited the French admiral for a suspension of hostilities, and was allowed twenty-four hours to conclude the capitulation of

the island. On the French general hastily inspecting the fortifications as soon as they were occupied by his troops, one of his suite is reported to have said to him, "It is well, General, that some one was within to open the gates for us. We should have had some difficulty in entering if the place had been altogether empty." General Vaubois with 4000 men was left in possession of the island, and the remainder of the troops sailed for Egypt.

In less than three months, the conduct of the French had increased the irritation of the Maltese to such a degree, that they broke out in a sudden and general revolt. Scarcely ever were conquerors less discreet than the French had been. In this short period they had abolished titles and ranks, reorganised all the establishments, formed a new government and municipality, and melted down the plate belonging to the churches. The law affecting the tenure of property had been tampered with, and a decree was issued directing that the sons of the richest families should be sent to France for their education. The terms of the capitulation were in fact regarded as a dead letter. The immediate occasion of the outbreak was an attempt to take some rich silk damask from the churches and convents. The writer of the article "Malta" in the 'Penny Cyclopædia,' a gentleman who resides in the island, gives the following account of the formidable attitude of the Maltese when their feelings of justice and patriotism were thoroughly aroused:—"The energy and daring which the Maltese thus early showed in their patriotic warfare, surprised General Vaubois, who had been accustomed to consider them as wretched peasants. From this moment the gates of Valletta and the three cities were closed, and the garrison was kept in a close state of blockade for two years. During this long period the Maltese gave proof of a patriotic ardour and long-suffering which few people would have equalled. Unanimous in their object, all their measures were taken with prudence and order. They collected arms and established a system which gave method to all their operations, and their levy of men was divided into bodies or battalions, and distributed in the towers on the coast and throughout the country, with almost as much order as regular troops. The attempts made by the French general at conciliation were not listened to; his messengers were never allowed to go back; and he soon found to his surprise that the people had firmness enough to persevere in the enterprise they had undertaken, notwithstanding they were at present single-handed. With more than 6000 well-disciplined troops under his command (the soldiers and the crews of the vessels which escaped from Aboukir having been incorporated with them), he was unable to make a sortie in sufficient force to overawe his enemies; for the people of Valletta, encouraged by the movement of their countrymen, and borne down by forced contributions and the privations inseparable from a state of siege, were not to be left unwatched within the walls."

During these two years it is stated that not fewer than 20,000 persons died of misery and famine; but in the midst of their difficulties the people spiritedly refused the offer of some of the recreant knights to come to their assistance, and assist in expelling the invaders. The French soldiers supported their privations with characteristic buoyancy. They made gardens in the fortifications, from which they raised fruit and vegetables. At one period a pound of fresh pork sold for 6*s.*; salt meat, 2*s.* 10*d.*; the commonest fish, 2*s.* 2*d.*; a fowl, 50*s.*; a pigeon, 10*s.*; a pound of sugar, 18*s.* 4*d.*; coffee, 21*s.* 8*d.*; a good fat rat, 1*s.* 7*d.*

After the battle of the Nile, Lord Nelson, who had become warmly interested in the Maltese, sent four Portuguese ships of the line and two frigates to blockade Valletta; and in little more than a month afterwards he appeared himself with fourteen ships of war, and summoned the French to surrender, to which a laconic refusal was sent by the French general. Lord Nelson was obliged to leave the island, his own ships being much disabled; but he left the Portuguese squadron to maintain the blockade. The future reliance of the Maltese was on Nelson and the British government. The king of Sicily had supplied them with powder and shot, and afterwards allowed them to receive corn from his granaries, on credit. Captain Ball, who commanded the blockading squadron subsequently appointed, had directions from Nelson to supply the inhabitants with provisions as far as was practicable. In the beginning of 1799 the affairs of the Maltese were placed on a footing which led to many immediate advantages. A congress was formed, of which Captain Ball was president, and under its eye the civil and military affairs were administered; a public loan was authorised; customs' duties regulated; and two bays were made the ports for trade. The blockade by sea and land was rigidly preserved, and batteries were raised, which kept the besieged constantly on the alert. In December, 1799, the Maltese were reinforced by several British and Sicilian regiments, who were officially styled the allied troops at the blockade of Valletta. In September, 1800, General Vaubois made proposals to surrender the place, and an act of capitulation was signed on the 5th, under which the French troops were allowed to march out as far as the sea-shore with all the honours of war, where they grounded their arms. The blockade had endured two years and two days. The British squadron entered the port the next day, and our ensign was hoisted at St. Elmo amidst the acclamations of the Maltese.

Lord Nelson had assured the Maltese that they should be under the protection of England, Russia, and Prussia, until the peace, which was eventually declared in 1802. According to the treaty of Amiens, the British troops were to have evacuated Malta, and the island was to be restored to the Knights, on condition that there should be neither an English nor a French "langue," and that a Maltese "langue," to be established, should enjoy all the privileges of the rest. But hostilities recommenced before these provisions of the treaty had been executed, and during the long war which followed Malta was held in military possession by Great Britain. During this memorable period it became the head-quarters of the British army in the Mediterranean, the rendezvous of our ships of war, and the emporium of an active commerce which was shut out from the continental ports.

When the peace at length came, Malta was formally recognised in the treaties signed by the representatives of the European powers as an integral part of the British dominions. The Maltese obtained a sovereign of their own choice, and, under the maritime power of Britain, that protection which their insular position renders essential to their prosperity.

THE ORIGIN, NATURE, AND USES OF IVORY.

Ivory, although in its most extensive sense, the name applied to the bony substance of the teeth of animals, is usually understood to be the tusks of the elephant. Those of the hippopotamus and the wild boar, as well as the horn or tooth of the narwahl, likewise go by the same name. The tusk of the elephant is of a circular or oval shape, several inches thick at the root, and several feet in length, if full grown. It is hollow for a considerable space from its insertion into the jaw, and always tapers to an obtuse extremity; most of the tusks are curved; generally more so in proportion to their size, for the smallest brought to this country are perfectly straight.

The tusks of the elephant may be considered to correspond with the canine teeth in other animals, and are situated one on each side of the upper jaw; those of the

female elephant being much smaller than those of the male. The largest found in the male elephant generally vary from five to eight feet in length, and from four to eight inches in diameter, and in weight from twenty to eighty pounds each; although there are instances on record of tusks exceeding these weights and dimensions in an extraordinary degree. Hartenfels, in his work on elephants, instances one of the enormous length of fourteen feet, in the possession of a merchant at Venice. Tusks have been found which weighed respectively 137, 208, 325, and 350 pounds. The increase in the dimensions and weight of the tusks arises from circular layers of ivory, which are furnished from within from the pulp in which they are formed. In some instances balls have been found in the body of the tusk, with which the animal has been shot when young, or at least the balls must have entered near the base of the tooth, as they are found imbedded in its hard substance. The temporary or milk tusks drop in twelve or sixteen months after birth, and are succeeded by the permanent tusks, which continue growing successively through life.

Much discussion has arisen as to the possibility of a musket-ball penetrating the tusk, for it has frequently happened that no sign of its entrance is visible at the surface, although a ball has been found within. On this subject the writer of 'The Menageries,' in the 'Library of Entertaining Knowledge,' quotes the following remarks from the 'Phil. Trans.' "If a ball penetrate the side of a tusk, cross the cavity, and lodge in the slightest way on the opposite side, it will become covered towards the cavity by the newly deposited layers of ivory, while no opening will exist between it and the surface to account for its entrance. If it have only sufficient force to enter, it will probably sink by its own weight between the pulp and tooth, until it rests at the bottom of the cavity. It there becomes surrounded by new layers of ivory; and as the tusk is gradually worn away, and supplied by new depositions, it will soon be found in the centre of the solid part of the tooth. Lastly, a foreign body may enter the tusk from above, as the plate of bone which forms its socket is thin; and if this descends to the lower part of the cavity, it may become imbedded by the subsequent formation of ivory. This must have happened in a case where a spear-head was found in an elephant's tooth. The long axis of the foreign body corresponded to that of the cavity. No opening for its admission could be discovered; and it is very clear that no human strength could drive such a body through the side of a tusk."

The substance ivory, of which the tusks consist, is hard and elastic, and considerably more transparent than white paper of equal thickness. The outside is covered with a kind of tough skin, softer than the remainder of the substance; and the interior cavity is lined with a similar skin. The ivory is coarser near this skin or bark than in its more central position, and is said to become sooner discoloured by exposure to the air. As this skin decreases towards the tip of the tusk, the ivory at that part is of a better quality than at other parts.

When the tusk is cut across transversely, its surface exhibits a tortuous granulated structure, the lines becoming finer and more delicate as we approach the centre of the substance. A late writer observes that on reducing a transverse section of a portion of very fine ivory to the thickness of one-hundredth of an inch, he found innumerable concentric circles surrounding the cavity, disposed, as it were, in bands of irregular breadth. At this thickness the ivory required a high polish to expose them, and they were indistinct without the aid of a magnifier. But on reducing a piece greatly thinner, and through which common printing could easily be read when laid upon a page, they were readily seen with the naked eye. When the ivory is cut lengthwise of the tusk, it appears of a lamellated structure, of uniform colour in a fine tusk, and with yellowish edges in others. The texture resembles that of wood; and on examining a thin plate it is found to be extremely similar to the general appearance of ash, consisting of alternate irregular light and dark streaks. From all these circumstances it is inferred that the tusk is formed of innumerable concentric circles of ivory, so intimately united as to constitute one solid and uniform substance; and when in a state of decomposition, by lying long on the earth, it separates into thin concentric conical plates.

The tooth of the narwahl is, generally speaking, as hard, fine, and white as elephant's ivory, though we believe it is not so much employed. On procuring very thin sections, both transverse and longitudinal, of this ivory, it is found to be very different in its internal structure from that of the elephant.

The tooth of the morse, or sea-horse, is found to afford the hardest and whitest of all ivory. The weight of these teeth does not in general exceed two or three pounds each; they are short and very much curved. A rough glassy enamel of excessive hardness covers the outer skin; it is said to be capable of striking fire with steel; can scarcely be removed with a file, and blunts a tool of the highest temper. The concentric layers of which these teeth consist are as fine as human hairs.

The beautiful nature of ivory naturally led to its adoption as a material wherewith to construct ornamental articles of various kinds. Nothing which is made of that material at the present day can at all compete with the magnificent statues wrought in Greece at the time when she was in the zenith of her glory. The labour, skill, and expense bestowed upon these statues must have been enormous. One such statue was forty feet high, and therefore necessarily made of an immense number of small pieces. It has been supposed that the ancients were able to obtain tusks larger than those commonly met with at the present day. That an art existed of rendering the cylindrical part of the tusk flat when cut through longitudinally; and that plates might thus be procured from six to twenty-four inches wide. It is further supposed that a block of wood having been fashioned as a sort of core or model, the individual plates of ivory were fixed upon it, having been cut and polished in exact resemblance to the corresponding portion of a model previously executed. (See, on this part of the subject, 'Penny Mag.,' vol. ii., p. 115.)

In later times ivory has been used for purposes of more humble pretensions, especially for articles where wood would be speedily destroyed, and where metal could not conveniently be used. It is in the hands of the turner that it is most frequently brought into useful shape; but extraordinary instances of carving in ivory are sometimes brought from abroad. A series of hollow spheres, sometimes amounting to twelve, or even fifteen in number, are cut out of one block of ivory, one within another, from the outside to the centre; these are cut by introducing tools through lace-pattern holes cut in the exterior.

Ivory possesses an elasticity and a smoothness which renders it valuable as a material for billiard and bagatelle balls. It is sometimes carved into the form of baskets, and is used extensively as an inlaying or a veneer for various articles of fancy furniture.

It is used for the scales of various kinds of mathematical instruments, as the indications can be very easily read on its surface. Other purposes to which it is applied are artificial teeth, the tablets for miniature paintings, and combs, in which seventy teeth are sometimes cut in the compass of an inch. It has also been used as a material for flutes; but it has been observed, and the writer can verify the observation, that the tone of these instruments is not so fine as that of flutes made of wood; there is a deficiency in mellowness of tone, arising probably from some peculiarity in the vibratory power of the material.

The mode of working up ivory into these various ob-

jects is by means of saws, files, and different kinds of edge-tools. The saws must be very thin, and frequently wetted during the process of sawing; oil is sometimes used for this purpose, although, unless the surface of the ivory be soon after worked, the oil is apt to impart a yellow colour to it. In some delicate operations the ivory is held under water while being sawed. The process of polishing is generally effected with pumice-stone and tripoli powder; or it can be polished with chalk and water or oil, applied with a piece of leather, and afterwards rubbed hard with a piece of dry leather. The better the quality of the ivory, the higher is the polish which it will receive.

Dr. Ure gives the following directions for *etching* on ivory. A ground for etching is procured by applying the following material to the polished surface. Take of pure white wax and transparent tears of mastich each one ounce; asphalt, half an ounce. The mastich and asphalt having been separately reduced to fine powder, and the wax being melted in an earthenware vessel in the fire, the mastich is to be first slowly strewed in, and dissolved by stirring, and then the asphalt in like manner. This compound is to be poured out into lukewarm water, well kneaded by the hand, as it cools, into rolls or balls about an inch in diameter, and then kept wrapped up in taffety. If white resin be substituted for the mastich, a cheaper composition will be obtained, which answers nearly as well: 2 oz. asphalt, 1 oz. resin, and half an ounce of white wax, being good proportions.

The ground being applied to the ivory, the figured design is to be traced through it in the usual way, a ledge of wax is to be applied, and the surface is then to be covered with strong sulphuric acid. The effect comes out better with the aid of a little heat; and by replacing the acid, as it becomes dilute by absorption of moisture, with concentrated acid. If an acid solution of silver or gold be used for etching, the design will become purple or black on exposure to sunshine. The wax may be washed away with oil of turpentine. Acid nitrate of silver affords the easiest means of tracing permanent black lines on ivory.

Ivory may be stained of various colours for ornamental purposes. A green dye may be given by steeping it in nitric acid tinged with copper or verdigris; and by converting nitric acid into aqua-regia, by dissolving a fourth part of its weight of sal-ammoniac in it, ivory may be stained of a fine purple colour. It may be stained yellow by boiling it in a solution of one pound of alum in two quarts of water; and then, having prepared a tincture of turmeric root, by boiling half a pound in a gallon of water, put the ivory into this tincture, and let it remain there half an hour. To obtain a blue dye, the ivory is first stained green, and then dipped into a solution of strong boiling-hot pearlash; or it may be boiled in tincture of indigo, and afterwards in a solution of cream of tartar.

Fossil elephants, the remains of by-gone ages, have furnished a good deal of ivory of late years. In France, Germany, Spain, Italy, and other parts of Europe, evidence exists that the elephant was once an inhabitant of these climes; but it is in the bleak and sterile districts of Siberia that the remains of the elephant—an inhabitant of warm climates—has excited most surprise. There is scarcely a river in Asiatic Russia but what has furnished elephant's tusks, skeletons, &c. on its banks, the ivory of which is found to be equal to that of elephants slain in Africa or the East Indies at the present day. We cannot enter further into this interesting subject; but it is impossible to avoid the conclusion, that at some remote period in the earth's history, that district, which is now so cold and desolate, was warm enough to furnish a habitation for the elephant, and to grow the food on which the elephant subsists.

Reading aloud.—One of the accomplishments which we wish to see cultivated among females, and which is greatly neglected or wholly overlooked, is the art of reading aloud. It is a most healthy employment when used discreetly, since exercise is as advantageous to the lungs as to all other parts of the human frame. The ability to read aloud agreeably is also a truly domestic acquirement; it will be another link in the chain which binds men to their hearths; it will amuse the young, cheer the old, and instruct the ignorant.—*Journal of Education*, art. 'Female Education.'

Effects of Geology on Manufactures and Man.—Perhaps there are few localities in which the advantages of geographical situation, combined with cheap fuel, arising from geological position, are better exemplified than at Swansea, where not only the copper ores of Cornwall and Ireland, but those also of Cuba and Chili, are brought to be smelted; these advantages even rendering it profitable to transport ores from the western shores of South America round Cape Horn to the fossil vegetation entombed in South Wales. It is not improbable that at some future period the South American copper ores may be reduced to metal more profitably in other and nearer countries in which sufficient coal may be discovered; but should this change take place, it would still be due to geological conditions. Merthyr Tydfil, in Glamorganshire, may be cited as an excellent example of the economic value of geological conditions; the proximity of the carboniferous limestone, the coal, and ironstone to each other, in that part of the country, producing a cheap combination of flux, fuel, and ore scarcely to be surpassed. It will readily be understood that, where a considerable portion of any given population, all other things being equal, lives by labour requiring constant skill, ingenuity, and judgment, that habits of reasoning and thought will be produced which would render it mentally superior to another given population in which the greater number of persons merely followed some routine occupation during their whole lives, in doing which they were not called upon to exercise any of the mental powers they might happen to possess. To those whose pursuits take them among the labouring part of the population, the variation in the mental condition of the people in the district under consideration is remarkably striking. This variation is no doubt due to many local causes; but among them the geological structure of the country would appear to hold a more important place than might perhaps, at first sight, be anticipated. The chief contrast would probably be found between the labourers on the poor lands of the carbonaceous series of north-western Devon and the miners of Cornwall, both considered in the mass. While the former are thinly distributed over the country, full of prejudices against improvement, and still often firm believers in witchcraft, ghosts, &c., the miners are thickly congregated together in the neighbourhood of the working lodes, abound with intelligence, and, from the constant exercise of their judgment, upon which indeed the living of a large proportion entirely depends, able to take correct and enlarged views of many other subjects than those immediately connected with their ordinary occupations. The miners, nevertheless, in Cornwall and Devon labour under considerable disadvantages as regards education, when compared with those of many other countries, where mining colleges or schools are founded. There is not a single place in the whole district where they can learn the results of the mining experience of other countries, and, by combining it with their own, advance both their knowledge and its practical application. Neither is there any school to teach them those sciences that bear upon their labours, and which would be so useful to them. The necessity of studying the varying conditions of their lodes has, nevertheless, so accustomed their minds to the habit of reasoning, that they certainly, as a mass, greatly exceed in intelligence the other labouring population of the district, which, with the exception of the fishermen and sailors, is chiefly agricultural; the manufactures carried on in the towns, omitting Tiverton and Chard, not being sufficiently important to impress a manufacturing character on them.—Mr. De la Beche's *Report on the Geology of Cornwall, Devon, and West Somerset.*

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